# **SIEMENS**

# **ARCADIS Avantic**

	SP
Chartura	
<b>Startup</b> System	
Start-up Instructions	
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#### **Document revision level**

The document corresponds to the version/revision level effective at the time of system delivery. Revisions to hardcopy documentation are not automatically distributed.

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# **Additionally Required Documents**

- ARCADIS Avantic Operator Manual
- ARCADIS Avantic Wiring Diagram
- IQ test (quality assurance)
- Image intensifier laser light localizer (optional) assembly and setting instructions

# **Tools, aids (partially for IQ test)**

•	Tool kit	97 02 457 Y1971
•	Dynamic test kit	37 90 156 X1963
•	Copper filter set	44 06 120 RV090
•	Densitometer	97 02 416 Y1996
•	Radiation filter set (incl. 25 mm Al)	97 98 596 G5321
•	Resolution test	28 71 820 RE999
•	Safety tester (leakage current and ground wire testing device) e.g., Unimed 1100	51 38 727 Y0766
	(Leakage current measurement only required in the case of a deviation of the local line voltage from the system delivery status).	

# Note on the log book

The log book is located in the monitor cart behind the keyboard. It is accessible if the cover on the back of the monitor cart is removed.

# Notes on adapting the power plug to local conditions.

The customer can have the power plug on the supplied power cable replaced with an appropriate local plug by an electrician, provided that:

- The power plug used can conduct the power required for the operation of the ARCADIS Avantic (refer to current and voltage values stated on the line voltage label, back of monitor cart).
- The required line internal resistance is reached (refer to ARCADIS Avantic Planning Guide).
- The selectivity of the fuse protection is assured according to the relevant national standards.

It must also be ensured by the customer that connection to an unsuitable power supply is prevented (e.g., by identification or design measures).

As concluding measures, perform and document protective conductor measurements (in Germany, e.g., in the medical device book).

# Note on the power connection

The system delivery state is provided by the power connection values on the the line voltage label (back of the monitor cart). Necessary adjustments to local conditions are to be performed as required according to the adjustment instructions of the ARCADIS Avantic system.

**∆WARNING** 

Danger high voltage!

Disregarding safety precautions can result in death or serious bodily injury.

□⇒ Before the line voltage is adapted, the power plug on the UPS in the monitor cart must be pulled out, since the monitor cart is not free of voltage after the power plug is pulled out.

# Notes on equivalent leakage current measurement

### Applicability and regulations for regional companies

The equivalent leakage current must be measured where applicable under the requirements of DIN VDE 0751 Part 1. Outside of the scope of application of DIN VDE 0751, the following rules are to be adhered to for the regional companies: (also see ARTD part 2, Security Rules for Assembly and Maintenance).

The national regulations apply primarily for the regional companies. In the event that there are no existing regulations, the following provisions should be adhered to in the interest of the safety of customers, patients, employees and third parties as well as the company.

#### First measured value

The equivalent leakage current measurement was performed at the factory and the measured value was entered in test protocol 1b. The measurement was made at the line voltage and line frequency recorded in test protocol 1b. The test protocol 1b is filed in the log book, register 3. When the line voltage and line frequency match, the value recorded in test protocol 1b is to be transferred as the initial measured value to the equivalent leakage current/protocol.

If the local line voltage or line frequency deviates from the delivery state of the ARCADIS Orbic, the values listed in test protocol 1b are invalid. The values are to be labeled invalid.

(Check the comment "values invalid" and confirm with name, date, and signature). The equivalent leakage current measurement must be repeated. Perform the measurement according to DIN VDE 0751, part 1 (see ARTD, part 2), and record the determined value as the initial measured value. This value must not exceed the maximum value of 2 mA for equivalent leakage currents for devices according to IEC 601 part 1/VDE 0750 part 1. The initial measured value is to be entered in the equivalent leakage current protocol (Leakage current measurement / p. 39). Comply with the measuring arrangement according to (Fig. 2 / p. 15). The system must be switched on during the measurement. When the Bender safety tester is used, this must therefore be set to manual measurement. Separate the page with the protocol from these instructions and file it in the log book, system folder.

### Repeat measurement

When service or repair work is performed on the primary power supply circuit (e.g., repairs to the power-on circuit or replacement of the line filter), the equivalent leakage current measurement must be repeated. Comply with the measuring arrangement according to (Fig. 2 / p. 15). The system must be switched on during measurement. When the Bender safety tester is used, this must therefore be set to manual measurement. The values measured in the repeat measurement may not exceed the threshold value of 2 mA as specified in VDE 0751, Part 1 (see also ARTD, part 2). In addition, they may not exceed the initial measured value by more than 50%. The system must be repaired if the limit is exceeded. Document the measured value in the equivalent leakage current protocol.

# **Safety information**

 When performing the work steps and checks, the general safety information for medical products must be observed.

### Switching the system to be free of voltage

 To switch the system to be free of voltage in all its parts, bring the system switch into the OFF position.

### Parts conducting voltage after system OFF and/or with power plug pulled out

#### Avantic basic unit



Danger high voltage!

Disregarding safety precautions can result in death or serious bodily injury.

- □⇒ Even after the system has been switched off and for an extended period afterward, voltage is still present in the electrolyte condenser battery and the generator boards (D20, D21 and D30).
- □⇒ Before work is started on the electrolyte condenser battery, it must must be discharged.
- □ To do this, switch D21.S2 must be set to the UZ\_OFF position; LEDs D21.X22 and D21.X23 must not continue to glow.
- Then the voltage between points X109.UZ\_IST(ACT) and X109.ANA\_GND is measured. The voltage must be ≤ 0.2V (corresponding to Uz <20V\_).
  </p>

### Monitor cart, monitors and image system



Danger high voltage!

When the system is switched off and even when the power plug is pulled out, the line voltage is still applied to the power assembly of the monitor cart, to the monitors and to the image system.

Disregarding safety precautions can result in death or serious bodily injury.

□⇒ Before work is done on the monitor cart, the power plugs must be pulled out of the UPS.



Dangerous radiation during checks and adjustments!

Risk of death or serious bodily injury!

- For checks and adjustments that must be performed with the radiation switched on, the prescribed radiation safety measures must be observed; if necessary, wear radiation protective clothing (see also ARTD-002.731.02.xx.xx and ARTD-002.731.38.xx.xx "General Guidelines for Technical Service").
- These checks and adjustments are explicitly designated on the following pages with the radiation warning symbol.



### **∆CAUTION**

#### Laser emissions!

This product contains two class 2 lasers. (USA: Laser class 2) as well as class 1 M (image intensifier light localizer)

Disregarding safety precautions can lead to bodily injury, especially to the retina of the eye, resulting in irreversible damage to vision.

□ Observe the safety information in ARTD-002.731.03... When working with the laser light localizer, do not look directly into the laser beam.

#### NOTE

### Laser emissions!

There is no direct hazard to the eye (blinking reflex). Nevertheless do not look directly into the laser beam.

# **Power Connection**

## **Measuring the Power Line Voltage**

- Measure the voltage and frequency at the intended outlet for the ARCADIS Avantic system.
- Compare the measured line voltage with the line voltage label on the back of the monitor cart.
  - The measured voltage must agree with the voltage read off from the label.

# The line voltage can be adapted at the transformer in the monitor cart.

### **∆WARNING**

Danger high voltage!

Disregarding safety precautions can result in death or serious bodily injury.

□⇒ Before the line voltage is adapted, the power plug on the UPS in the monitor cart must be pulled out, since the monitor cart is not free of voltage after the power plug is pulled out.

## Adapting the line voltage

- Remove the back, bottom covers (Fig. 1 / p. 14) from the monitor cart.
- Pull the power plug out of the UPS in the monitor cart.
- Adapt the voltage by changing the connections to transformers T1 and T2. Refer to the ARCADIS Avantic wiring diagram.

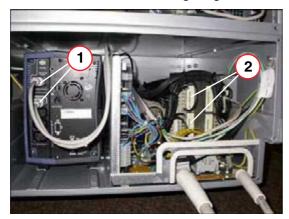


Fig. 1: Monitor cart line voltage

Pos. 1 Power plug
Pos. 2 T1 and T2

# Measuring the system leakage current

NOTE

Perform the system leakage current measurement only if the line voltage on the ARCADIS Avantic system must be adapted to the local line voltage.

See also (Notes on equivalent leakage current measurement / p. 10).

Measuring arrangements for system leakage current with tester VDE 0751 October 2001 (preferred measuring method)

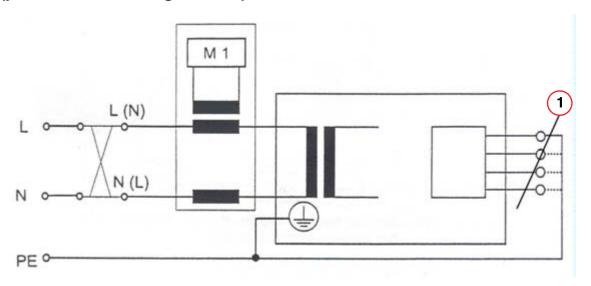


Fig. 2: Measuring circuit for measuring the system leakage current according to the differential current method

- Perform measurement configuration according to (Fig. 2 / p. 15). Application part (1/Fig. 2 / p. 15) is not available in ARCADIS Avantic.
- Perform measurement and repeat measurements.
- Document the measured values in the "Leakage current test protocol", (Leakage current measurement / p. 39).

Measuring arrangements for system leakage current with tester VDE 0751 October 1990 (e.g. Bender tester)

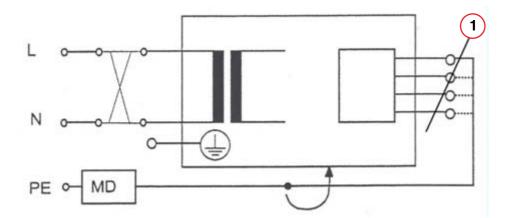


Fig. 3: Measuring circuit for the direct measurement of the system leakage current

- Measurement configuration according to (Fig. 2 / p. 15) application part (1/Fig. 3 / p. 16) is not available in ARCADIS Avantic.
- For safety reasons, place the system on an insulated base.
- Perform measurement and repeat measurements.
- Document the measured values in the "Leakage current test protocol", (Leakage current measurement / p. 39).

## **Function check of the EMERGENCY STOP switches**

- Connect the system to the voltage and boot it.
- Click "Emergency" for the patient registration.
- Activate the EMERGENCY STOP switch on the C-arm.
- The safety switch moves audibly and the following message appears on the lower left monitor edge: "The emergency stop has been pressed"
- Disengage the EMERGENCY STOP switch.
- The safety switch moves audibly and the following message appears on the lower left monitor edge: "The emergency stop switch has been released."
- Document the function of the EMERGENCY STOP switch in the "Test protocol, C-arm movement and emergency stop" (C-arm movement and emergency stop / p. 38).

# **Functional checks**

Operating the ARCADIS Avantic, refer to the Operator Manual



- Stand and C-arm system movements
- Semi-transparent slot and iris diaphragm in fluoroscopy procedure.



- Collimation of the semi-transparent slot and iris diaphragm using fluoroscopy procedure.
- Mechanical functions of the monitor cart

# **Testing the Protective Conductors**

• The system must be free of voltage.

Measuring de Protective conductor testing device; e.g., safety tester Unimed

vice: 11

Measuring de- Max. 0.2 Ohm (observe country-specific regulations!) (current:

vice: 10 A

• Test procedure: Measure between all touchable, conductive parts of the system

and the protective conductor wire at the ARCADIS Avantic

power plug.

# Functional test of C-arm lift movement and parking brakes

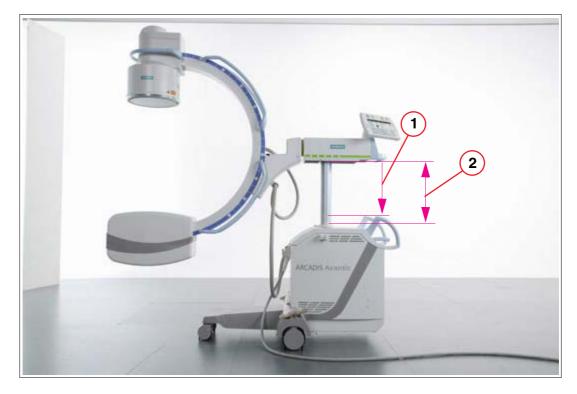


Fig. 4: Function test

- Switch on the main system (C-arm).
- To move the C-arm downward, press the downward button.
- The lifting column moves to position 1 (1/Fig. 4 / p. 20) and remains there automatically. A stop signal (3 beeps) sounds simultaneously.
- To lower the lifting column further, press the downward button once again.
- The lifting column can then be moved by a further 7cm to the lowest point, position 2
  (2/Fig. 4 / p. 20). In this area a signal (3 beeps) sounds for safety reasons each time the
  downward button is pressed.
- To move the C-arm upward, press the upward button. No signal sounds in this case.
- When both switches are pressed, the lifting motor moves in the initially selected direction.
- Loosen the different parking brakes and apply them again. Secure blocking of the relevant movement must be assured.
- Document the function of the C-arm movements, brakes and warning signals in the test protocol, "C-arm movement and emergency stop".

# **System configuration**

• Please clarify in advance with the customer whether the following system configurations are required.

## Service login:

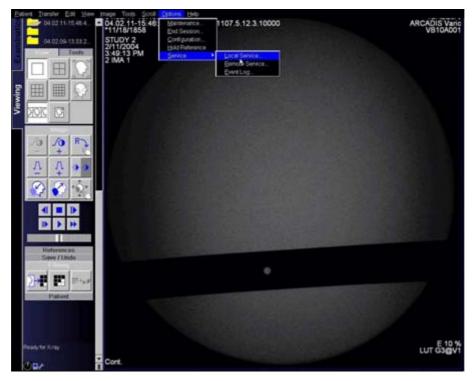


Fig. 5: Service login

• Select <Options> <Customer service> <Local service>.

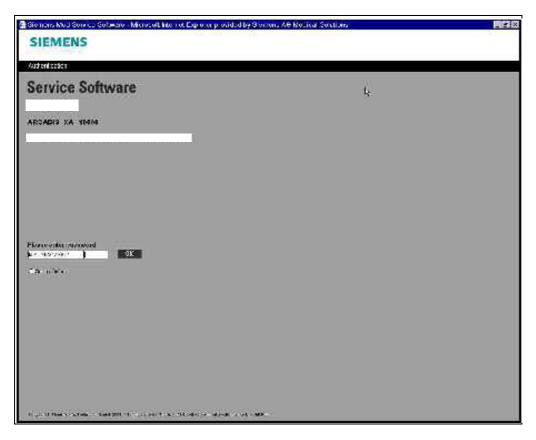


Fig. 6: Authentication\_

• Enter the 6-character password and click **OK** (see system folder for password).

## **Customer address configuration**

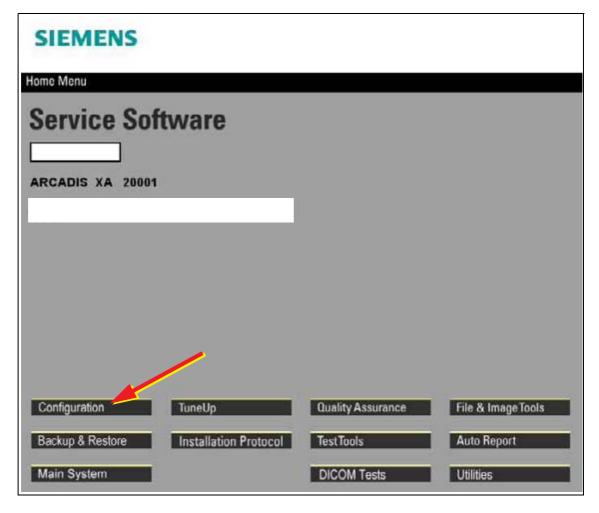


Fig. 7: Configuration\_

• Select < Configuration >.



Fig. 8: Configuration

• Click < Next>.



Fig. 9: Local Host

Click <Site Info>.

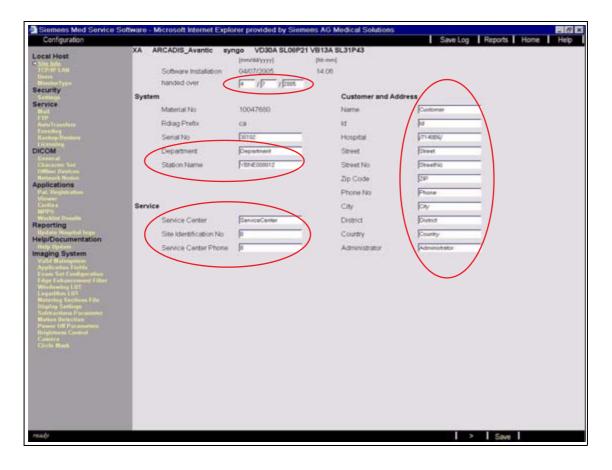


Fig. 10: Site info

- The marked customer-specific data may be adapted. Do not change "Serial No.".
- Click <Save>.
- Click < Home>.

# Main system configuration

• In the service software, select "Main System".

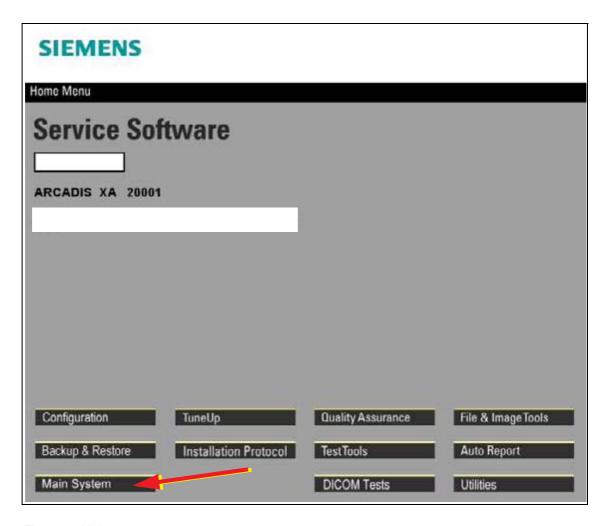


Fig. 11: Main\_system

Click < Main system>.



Fig. 12: Mainsys start

• Select ARCADIS Avantic - I.I. type and click < Next>.

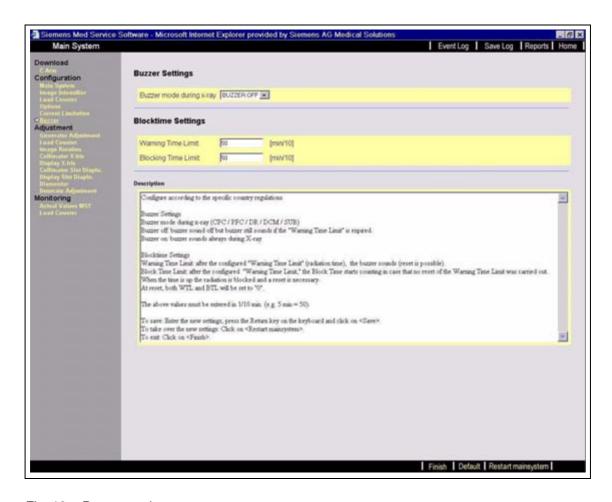


Fig. 13: Buzzer setting

• Under Configuration click < Buzzer >.

#### Make changes according to the following description:

- Block time settings
  - **Warning time limit:** The buzzer sound starts when the entered radiation time has elapsed.
  - **Block time limit:** After the entered radiation time has elapsed without reset of the "warning time limit" the radiation is blocked the next time it is selected. Every reset of "Warning Time Limit" also resets the "Block Time Limit" to "0".
- Buzzer mode (indirect, I.I.)
  - **Buzzer off:** Buzzer sound off. Exceptions: Push mode and "Warning Time Limit" has ended.
  - **Buzzer on:** Buzzer sound always during radiation.

The country-specific regulations must be observed for the max. fluoroscopy time and radiation blockage.

### **Factory setting:**

	Fluoroscopy alarm	Fluoroscopy blocking
USA	4.5 min.	5 min.
Service mask input in 1/10 min.	45	5
Europe	5 min.	10 min.
Service mask input in 1/10 min.	50	50

- Make country-specific changes and click < Save >.
- Click < Home > .
- If a change is made to the fluoro time, check this function.

### Fluoroscopy footswitch configuration.

NOTE

The footswitch is set at the factory so that fluoroscopy is performed with the left pedal and the freely-selectable operating modes such as digital radiography, SUB, etc., are performed with the right pedal. The setting can be changed to meet customer requirements.

Program the footswitch as follows.

- Start service program and log in as described under "Service Login".
   Select Main System / Configuration / Main System / Footswitch CFC / right.
- Save the changes with <Save>.

Click < Home>.

If any reprogramming has been performed, the label attached to the footswitch must be removed and replaced by the new label; the replacement label is attached to the footswitch with a cable tie.

If a change is made to the pedal configuration, the function must be checked.

### Country-specific adaptation of the maximum tube current

NOTE

A maximum tube current limit is required - as far as known - only in Denmark.

• Start service program and log in as described under "Service Login".

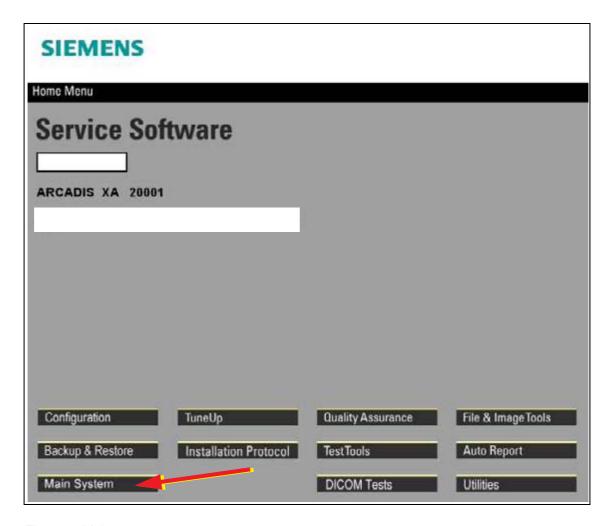


Fig. 14: Main\_system

Click < Main system>.



Fig. 15: Mainsys start

• Select ARCADIS Avantic - I.I. type and click < Next>.

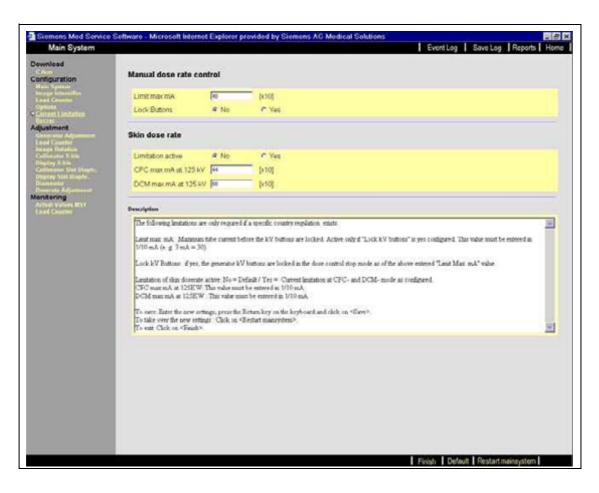


Fig. 16: Current limitation

- Click < Current limitation >.
- Make country-specific changes (only Denmark) and click <Save>.
- Click <Home>.

# **Backup**

NOTE

A backup must be created following software installation, every software update, and every system adjustment.

- Select "Backup & Restore" in the Service Software Home Menu.
- Place the backup CD (located in the monitor cart service compartment) in the CD-ROM drive.



Fig. 17: Backup & Restore\_Command

Select the <Backup> command.



Fig. 18: Backup & Restore\_Command\_Backup

- Select the respective drive under Drives.
  - Save to CD-ROM (standard save).

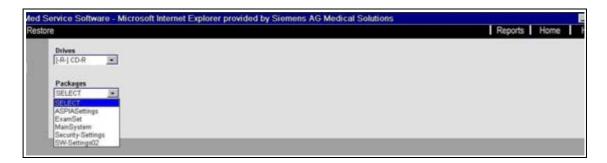


Fig. 19: Backup

### SW - Settings02

Select "SW-Settings02" under Packages.



Click <Go> and wait until the message "Ready" appears in the footer.

Fig. 20: Backup & Restore\_Command\_Backup\_SW-Settings02

### ASPIA settings

- Select "ASPIA settings" under Packages.
- Click <Go>
  - Wait until "Ready" is displayed in the footer.

#### Exam set

- Select "ExamSet" under Packages.
- Click < Go>
  - Wait until "Ready" is displayed in the footer.

### **Security settings**

For systems with HIPAA configuration

- Select "Security-Settings" under Packages.
- Click <Go>
  - Wait until "Ready" is displayed in the footer.

#### Main system

- Select "MainSystem" under Packages.
  - Wait until "Ready" is displayed in the footer.

#### **Exiting backup**

- Close the window via < Home>.
- Remove the backup CD-ROM from the CD-ROM drive.
- Store the CD-ROM with the other system documentation.

**NOTE** 

It is not possible to perform a backup of the database (patient images)!

Store the patient images in an archive.

Saving to CD-ROM as a long-term archive is prohibited.

# Paper printer (optional)

**NOTE** 

The software (driver) for the supplied printer was preinstalled at the factory.

## Sony printer UP-D72 X

Perform the following steps according to the user manual for the printer (CD-ROM):

- Unpack the printer.
- Fill the paper tray with paper (follow instructions on paper package).
- Plug in the USB cable.
- Print a test page after the automatic test.
- Follow the instructions on the CD-ROM from the manufacturer in the event of problems.

# **Final Work Steps**

#### IQ test

Perform IQ test according to instructions SPR2-330.820.01.xx.xx.

Remove the supplied IQ test protocols from the monitor cart service compartment.

### Configuring the network (optional) and remote service

Configure the network according to the Configuration Guide, SPR2-330.843.02.01.xx.xx and the remote connection according to Installation, Siemens Remote Service, SP00-000.816.02.01.xx.xx.

### **Completing protocols**

After completing all adjustment work steps and check measurements, the responsible technician must sign and date the test protocols and country-specific protocols to confirm that all values have been correctly determined and recorded.

### Completing the "ARCADIS Avantic Installation" protocol.

The manufacturer of this product requires information and the legislator demands proofs that a product delivered free of defects from the factory continues to possess the required and certified quality properties on installation and start-up.

It is therefore absolutely necessary that the installation report with the installation and start-up data is sent without delay after completion of the work to the address stated on the installation report.

You will find the report in the system folder.

# C-arm movement and emergency stop

System: ARCADIS Avantic	
Material no.:	
Serial number:	

Tab. 1 C-arm movement and emergency stop protocol

Movement	ОК	Name	Date	Initials
	Yes/No			
Releasing/locking the brakes				
Downward movement, position 1				
Downward movement, position 2				
The warning signals sound as described.				
Function, EMERGENCY_STOP_button				

# Leakage current measurement

System: ARCADIS Avantic	
Material no.:	
Serial number:	
Measuring arrangement: s	ee reverse:

Tab. 2 Leakage current measurement

	Equivalent	Measuring	Name	Date	Initials
	leakage cur- rent	instrument used, serial no.			
First measured value					
Repeat measurement 1					
Repeat measurement 2					
Repeat measurement 3					
Repeat measurement 4					
Repeat measurement 5					
Repeat measurement 6					
Repeat measurement 7					
Repeat measurement 8					
Repeat measurement 9					
Repeat measurement 10					
Repeat measurement 11					
Repeat measurement 12					
Repeat measurement 13					

	Equivalent leakage cur- rent	Measuring instrument used, serial no.	Name	Date	Initials
Repeat measurement 14					
Repeat measurement 15					
Repeat measurement 16					
Repeat measurement 17					
Repeat measurement 18					
Repeat measurement 19					
Repeat measurement 20					

Network checklist			
Network checklist (1+)	For SAP order no.:		
Will the system have a network PACS)?	k connection (HIS/RIS, Camera,	Yes	No

Mandatory for image system with network connection!

To ensure that the system is preconfigured at the factory and thus optimize installation at the customer site, we request that you complete and return this list if a network connection is available (and used).

Person responsible for network configuration at customer site

Name:	
Phone/fax:	
E-mail:	

### System network data

Tab. 3 System network data

	Not networked
Identification:	
Computer name	* Configuration/Local Host/TCP IP address
IP address:	
TCP/IP address	* Configuration/local host/TCP IP address
Subnet mask	* Configuration/local host/TCP IP address
Gateways	* Configuration/local host/TCP IP address
General: Local AE title for:	
HIS/RIS	* Configuration/DICOM/General
Study transfer	* Configuration/DICOM/general
Print	* Configuration/DICOM/general
Comments	

Network data for HIS/RIS network partner (only with HIS/RIS option)

Tab. 4 Network data for HIS/RIS

		Not available
Device:	Version:	Manufacturer:
Host properties:		
Host name		* Configuration/DICOM/HIS RIS nodes
TCP/IP address		* Configuration/DICOM/HIS RIS nodes
General Node Properties		
Logical name		* Configuration/DICOM/HIS RIS nodes
Application entity		
AE title		* Configuration/DICOM/HIS RIS nodes
Port number		* Configuration/DICOM/HIS RIS nodes
Comment:		1

## Network checklist (2+)

Network data for diagnostic console/archive system (only with DICOM Basic option) (1)

Tab. 5 Network data for reporting console/archiving system

Information on each:	Reporting console/ Archive system		Not available
Product:	Version:		Manufacturer:
Host properties:			
Host name			* Configuration/DICOM/network nodes
TCP/IP address			* Configuration/DICOM/network nodes
General node properties:			
Logical name			* Configuration/DICOM/network nodes
Application entity:			
AE title			* Configuration/DICOM/network nodes
Port number			* Configuration/DICOM/network nodes
Supported Dicom Services			
Storage	yes	no	* Configuration/DICOM/network nodes
Storage commitment	yes	no	* Configuration/DICOM/network nodes
	Node name:		* Configuration/DICOM/network nodes
Query	yes no		* Configuration/DICOM/network nodes

Retrieve	yes	no	* Configuration/DICOM/network nodes
Comment:			

# Network data for diagnostic console/archive system (only with DICOM Basic option) (2)

Tab. 6 Network data for reporting console/archiving system

Information on each:	Reporting console/ Archive system		Not available	
Product:	Version:		Manufacturer:	
Host properties:				
Host name			* Configuration/DICOM/network nodes	
TCP/IP address			* Configuration/DICOM/network nodes	
General node properties:				
Logical name			* Configuration/DICOM/network nodes	
Application entity:				
AE title			* Configuration/DICOM/network nodes	
Port number			* Configuration/DICOM/network nodes	
Supported Dicom Services				
Storage	yes	no	* Configuration/DICOM/network nodes	
Storage commitment	yes	no	* Configuration/DICOM/network nodes	
	Node name:		* Configuration/DICOM/network nodes	
Query	yes	no	* Configuration/DICOM/network nodes	
Retrieve	yes	no	* Configuration/DICOM/network nodes	
Comment:				

### **Network checklist (3-)**

Network data for a DICOM camera in the network (only with the DICOM Print option) (1)

Tab. 7 Network data for DICOM camera in the network

Information for		Any camera		No camera available
Device:		Version:		Manufacturer:
	Default camera	yes no		
Host properties:				
	Host name			* Configuration/DICOM/Print devices

TCP/IP address	* Configuration/DICOM/Print devices
General node properties:	
Logical name	* Configuration/DICOM/Print devices
Application entity:	
AE title	* Configuration/DICOM/Print devices
Port number	* Configuration/DICOM/Print devices
Comment:	

# Network data for a DICOM camera in the network (only with the DICOM Print option) (2)

Tab. 8 Network data for DICOM camera in the network

Information for	Any camera		No camera available	
Device:	Version:		Manufacturer:	
Default camera	yes no			
Host properties:				
Host name			* Configuration/DICOM/Print devices	
TCP/IP address			* Configuration/DICOM/Print devices	
General node properties:				
Logical name			* Configuration/DICOM/Print devices	
Application entity:				
AE title			* Configuration/DICOM/Print devices	
Port number			* Configuration/DICOM/Print devices	
Comment:				

n.a. / first version